CHAPTER 3

EMPLOYMENT OF HAND GRENADES

This chapter addresses the fundamentals that develop a soldier's skill and confidence in hand grenade use. These fundamentals include proper carrying, proper handgrips, and the three basic hand grenade throwing techniques. This chapter explains how effective and versatile the hand grenade is and how easily it can be carried. The tactical employment of hand grenades is limited only by the imagination of the user. With confidence and good training, soldiers can put this small but powerful weapon to good use against enemy forces or in any training environment.

Section I. INTRODUCTION TO HAND GRENADE TRAINING

The rifle, the bayonet, and the hand grenade are the soldier's basic lethal weapons. Historically, hand grenade training has received less emphasis than marksmanship and bayonet training. The hand grenade must receive greater emphasis in training programs and field training exercises. The proper use of hand grenades could determine the fate of the soldier or the success of the mission.

Leaders at all levels should study the employment of grenades in conjunction with the unit mission and implement a training program that supports that mission. Once soldiers can safely arm and throw live fragmentation grenades, units should integrate the use of grenades into collective tasks, rather than training these skills as a separate event. Hand grenades must be integrated with other available weapons systems to enhance the unit's combat power on the modern battlefield. We must conduct hand grenade training in the same manner in which we plan to fight.

We cannot let the danger associated with hand grenades deter our training efforts. Proper control and safety procedures allow us to conduct hand grenade training in a safe manner. Train soldiers to standard, and safety is inherent.

Hand grenades include more than casualty-producing instruments of war. They are used to signal, screen, and control crowds. The current inventory provides a specific hand grenade for most circumstances. Soldiers must be familiar with current grenades, their descriptions, and how best to employ each.

3-1. HAND GRENADE STORING

The storing of hand grenades on ammunition pouches is one of the most neglected aspects of hand grenade training. Experiences of American infantry, both in combat and in training, point out the need for specific training in storing hand grenades on ammunition pouches and integration of this type of training into tactical training exercises. Commanders should make every effort to issue training hand grenades for wear and use during all training activities. The soldier must be as confident in carrying and using hand grenades as he is with his rifle and bayonet. Before storing a hand grenade, take the following safety precautions:

a. Check the grenade fuze assembly for tightness. It must be tightly fitted in the grenade fuze well to prevent the grenade from working loose and separating from the grenade body. Never remove the fuze from a grenade.

b. If the grenade safety lever is broken, do not use the grenade. A broken safety lever denies the thrower the most critical safety mechanism of the grenade.

c. Do not bend the ends of the safety pin back flush against the fuze body. This practice, intended to preclude the accidental pulling of the pin, makes the removal of the safety pin difficult. Repeated working of the safety pin in this manner causes the pin to break, creating a hazardous condition.

d. Carry hand grenades either on the ammunition pouch, using the carrying safety straps that designed specifically for this purpose (Figure 3-1), or in the grenade pockets of the enhanced tactical load-bearing vest (Figure 3-2).

(1) *Standard ammunition pouch*. Open the web carrying sleeve on the side of the ammunition pouch and slide the grenade into the sleeve with the safety lever against the side of the ammunition pouch. Be sure the pull ring is in the downward position. Wrap the carrying strap around the neck of the fuze and snap the carrying strap to the carrying sleeve.

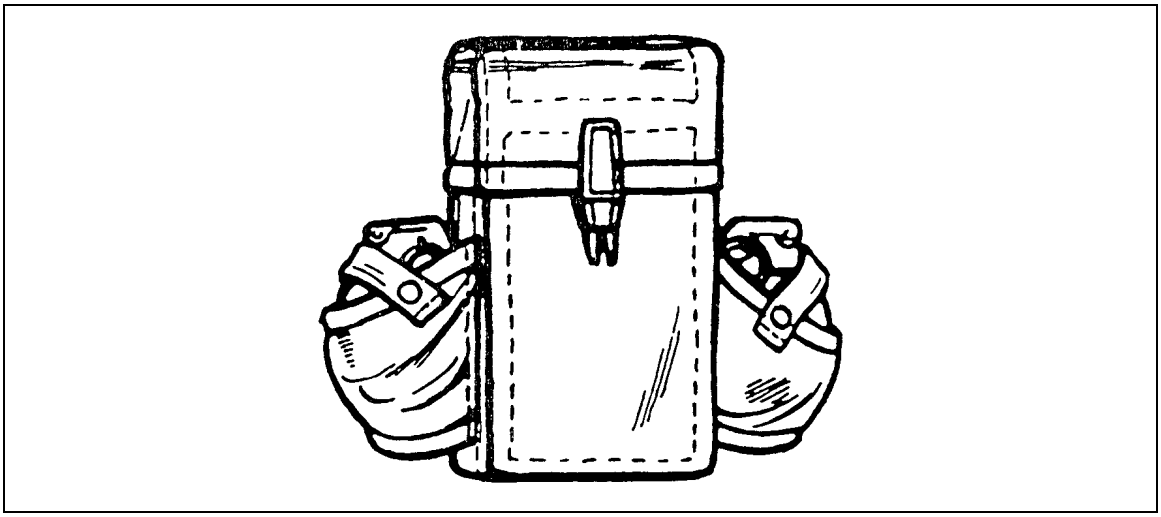


Figure 3-1. Standard ammunition pouch.

(2) *Enhanced tactical load-bearing vest*. The enhanced tactical load-bearing vest (ETLBV) has slanted pockets for carrying hand grenades. The grenades are not exposed and are safer to carry than in the standard ammunition pouch. The ETLBV is intended to provide the combat soldier with a comfortable and efficient method of transporting the individual fighting load.

- **Description**. The ETLBV has permanently attached ammunition and grenade pockets. The vest is compatible with the standard equipment belt. It incorporates adjustments to allow for proper fitting.
- **Components materials**. The ETLBV has 7 yards and 5 ounces of nylon fabric and nylon webbing.
- **Color**. The coloring of the ETLBV is woodland camouflage.
- **Weight**. The ETLBV weighs 1.9 pounds.

- **Size**. The ETLBV comes in one size that fits all.
- **Basis of issue**. Each infantry soldier should receive one ETLBV.

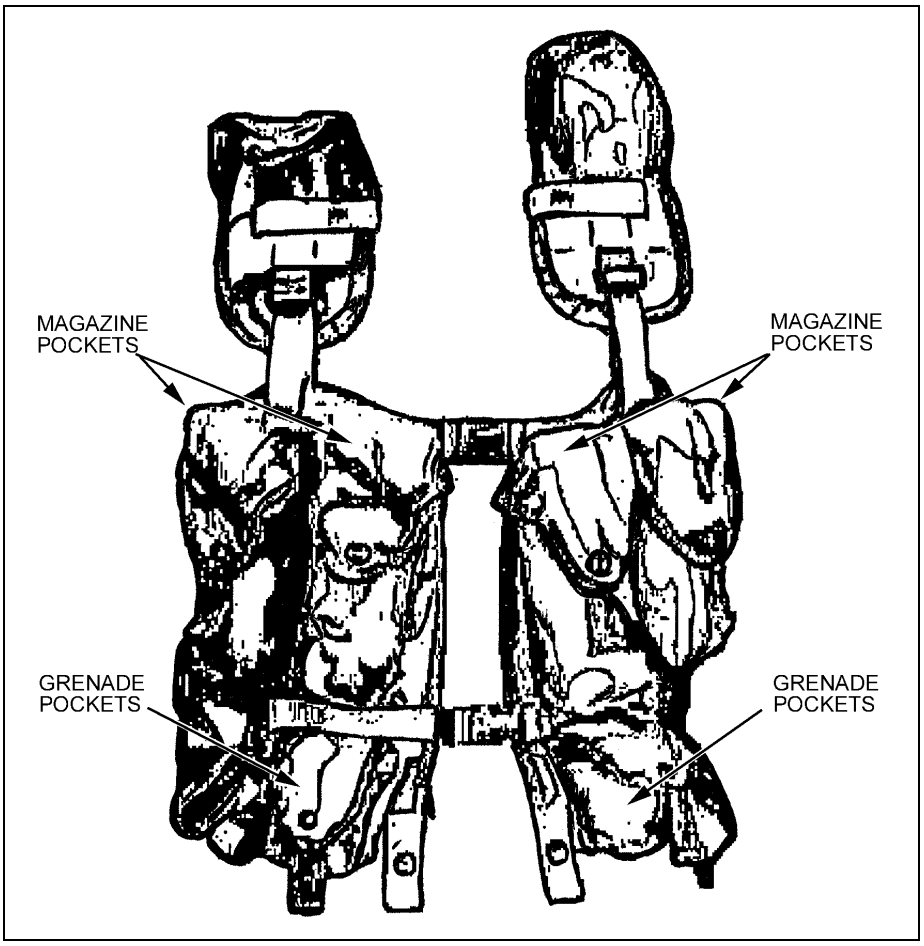


Figure 3-2. Enhanced tactical load-bearing vest.

3-2. HAND GRENADE GRIPPING PROCEDURES

The importance of properly gripping the hand grenade cannot be overemphasized. Soldiers must understand that a grenade not held properly is difficult to arm. Sustainment training is the key to maintaining grip efficiency. Gripping procedures differ slightly for right- and left-handed soldiers:

a. Holding the grenade in the throwing hand with the safety lever placed between the first and second joints of the thumb provides safety and throwing efficiency.

b. Right-handed soldiers hold the grenade upright with the pull ring away from the palm of the throwing hand so that the pull ring can be easily removed by the index or middle finger of the free hand (Figure 3-3).

c. Left-handed soldiers invert the grenade with the fingers and thumb of the throwing hand positioned in the same manner as by right-handed personnel (Figure 3-4).

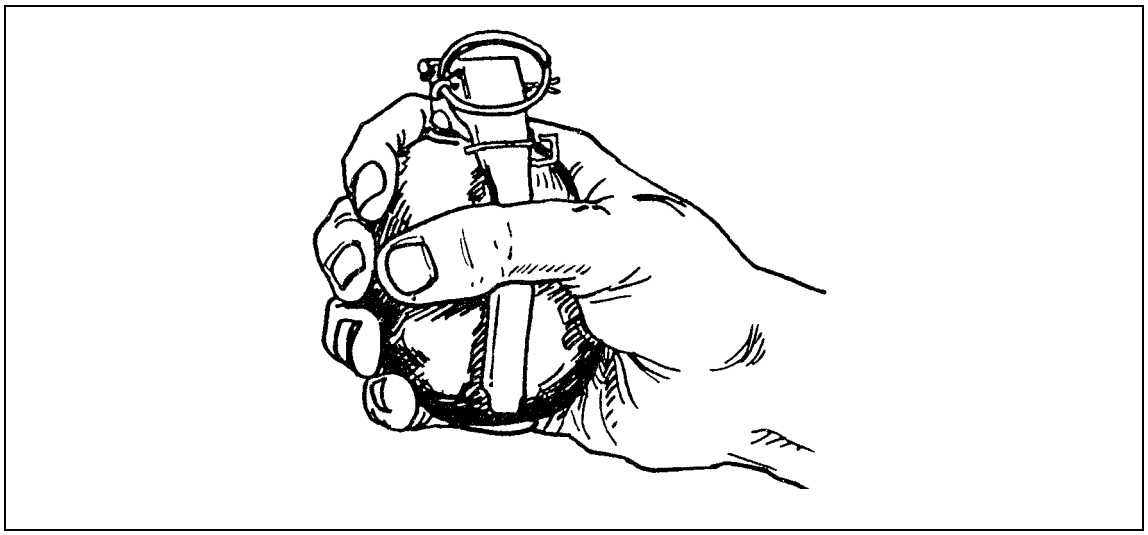


Figure 3-3. Right-handed grip.

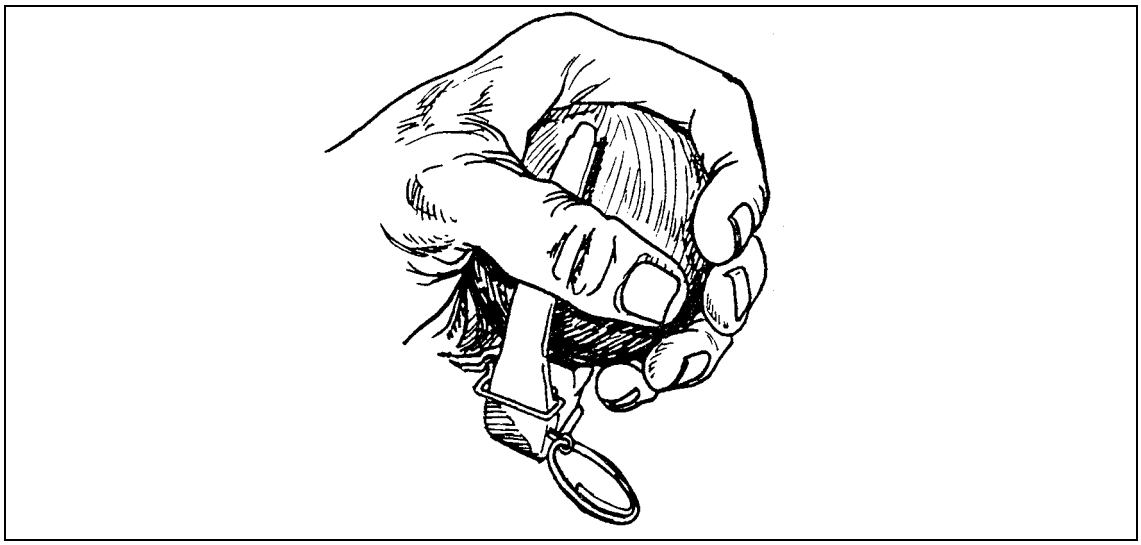


Figure 3-4. Left-handed grip.

3-3. HAND GRENADE THROWING

Since few soldiers throw in the same manner, it is difficult to establish firm rules or techniques for throwing hand grenades. How accurately they are thrown is more important than how they are thrown. If a soldier can achieve more distance and accuracy using his own personal style, he should be allowed to do so as long as his body is facing sideways, towards the enemy's position, and he throws basically overhand. There is, however, a recommended method of throwing hand grenades.

a. **Employ Grenades**. Use the following procedures:

(1) Observe the target to mentally establish the distance between your throwing position and the target area. In observing the target, minimize your exposure time to the enemy (no more than 3 seconds).

(2) Grip the hand grenade in your throwing hand.

(3) Grasp the pull ring with the index or middle finger of your nonthrowing hand. Remove the safety pin with a pulling and twisting motion. If the tactical situation permits, observe the safety pin's removal.

(4) Look at the target and throw the grenade using the overhand method so that the grenade arcs, landing on or near the target.

(5) Allow the motion of your throwing arm to continue naturally once you release the grenade. This follow-through improves distance and accuracy and lessens the strain on your throwing arm.

(6) Practice the necessary throws that are used in combat, such as the underhand and sidearm throws. Soldiers can practice these throws with practice grenades, but they must throw live fragmentation grenades overhand in a training environment.

b. **Throwing Positions**. In training, throwing positions are used for uniformity, control, and to familiarize soldiers with the proper manner of throwing grenades in combat if the situation gives you a choice. Consider the following throwing positions when employing grenades:

(1) *Standing*. The standing position (Figure 3-5) is the most desirable and natural position from which to throw grenades. It allows you to obtain the greatest possible throwing distance. Soldiers normally use this position when occupying a fighting position or during operations in fortified positions or urban terrain. Use the following procedures when throwing from this position:

(a) Observe the target to mentally estimate the distance. Use the proper handgrip and arm the grenade while behind cover.

(b) Assume a natural stance with your weight balanced equally on both feet. Hold the grenade shoulder high and hold the nonthrowing hand at a 45-degree angle with the fingers and thumb extended, joined, and pointing toward the intended target.

(c) Throw the grenade with a natural motion, using the procedures described in paragraph 3-3.

(d) Seek cover to avoid being hit by fragments or direct enemy fire. If no cover is available, drop to the prone position with your Kevlar facing the direction of the grenade's detonation.

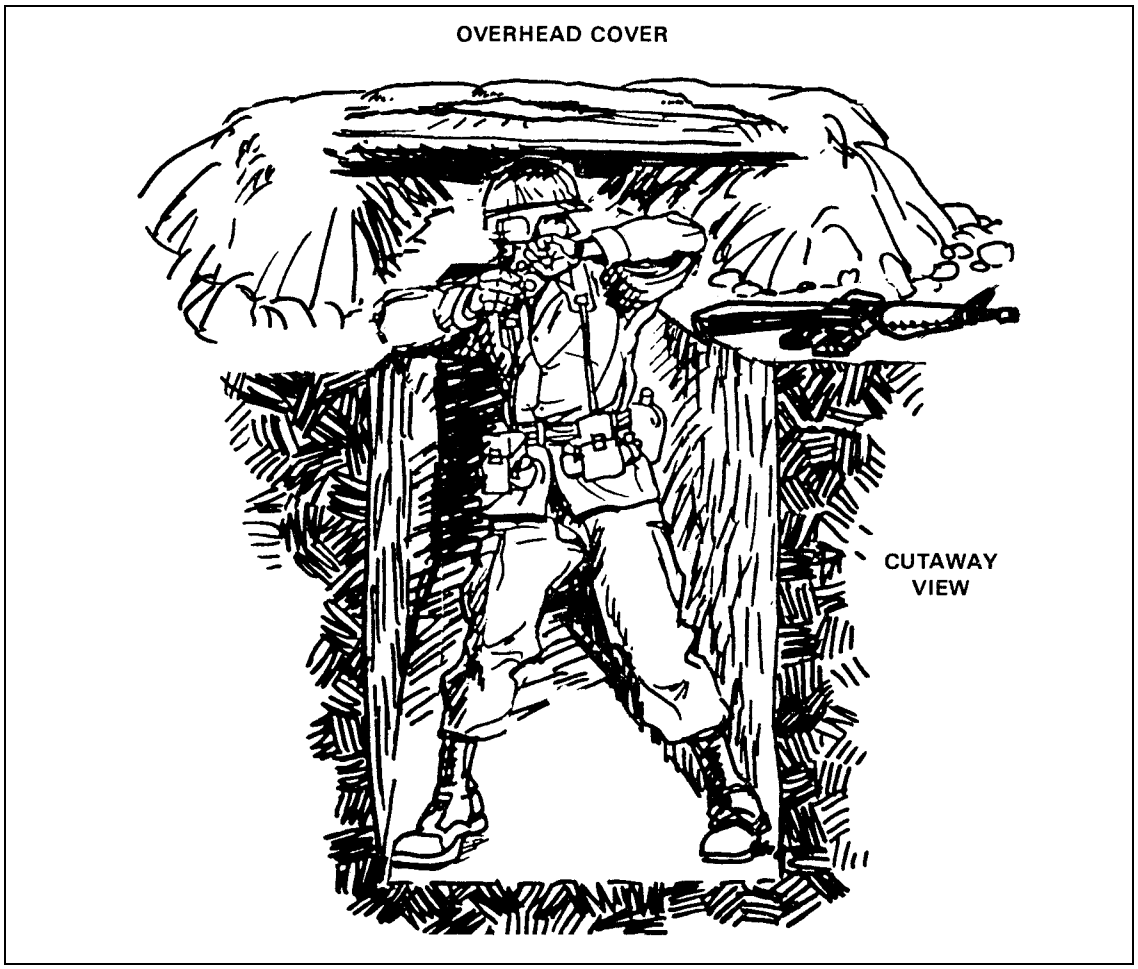


Figure 3-5. Standing throwing position.

(2) *Kneeling*. The kneeling position (Figure 3-6) reduces the distance a soldier can throw a grenade. It is used primarily when a soldier has only a low wall, a shallow ditch, or similar cover to protect him. Use the following procedures when throwing from this position:

(a) Observe the target to mentally estimate the throwing distance. Using the proper grip, arm the grenade while behind cover.

(b) Hold the grenade shoulder high and bend your nonthrowing knee at a 90-degree angle, placing that knee on the ground. Keep your throwing leg straight and locked, with the side of your boot firmly on the ground. Move your body to face sideways toward the target position. Keep your nonthrowing hand at a 45-degree angle with your fingers and thumb extended, joined, and pointing toward the enemy position.

(c) Throw the grenade with a natural throwing motion. Push off with your throwing foot to give added force to your throw. Follow through with your throwing arm as described in paragraph 3-3.

(d) Drop to the prone position or behind available cover to reduce exposure to fragmentation and direct enemy fire.

Figure 3-6. Kneeling throwing position.

(3) *Alternate prone*. The alternate prone position (Figure 3-7) reduces both distance and accuracy. It is used only when an individual is pinned down by hostile fire and is unable to rise to engage his target. Use the following procedures when throwing from this position:

(a) Lie down on your back with your body parallel to the grenade's intended line of flight. Hold the grenade at chin-chest level and remove the safety pins.

(b) Cock your throwing leg at a 45-degree angle, maintaining knee-to-knee contact and bracing the side of your boot firmly on the ground. Hold the grenade 4 to 6 inches behind your ear with your arm cocked for throwing.

(c) With your free hand, grasp any object that is capable of giving added leverage to increase your throwing distance. In throwing the grenade, push off with your rearward foot to give added force to your throw. Do not lift your head or body when attempting to throw a grenade as this exposes you to direct enemy fire.

(d) After throwing the grenade, roll over onto your stomach and press flat against the ground.

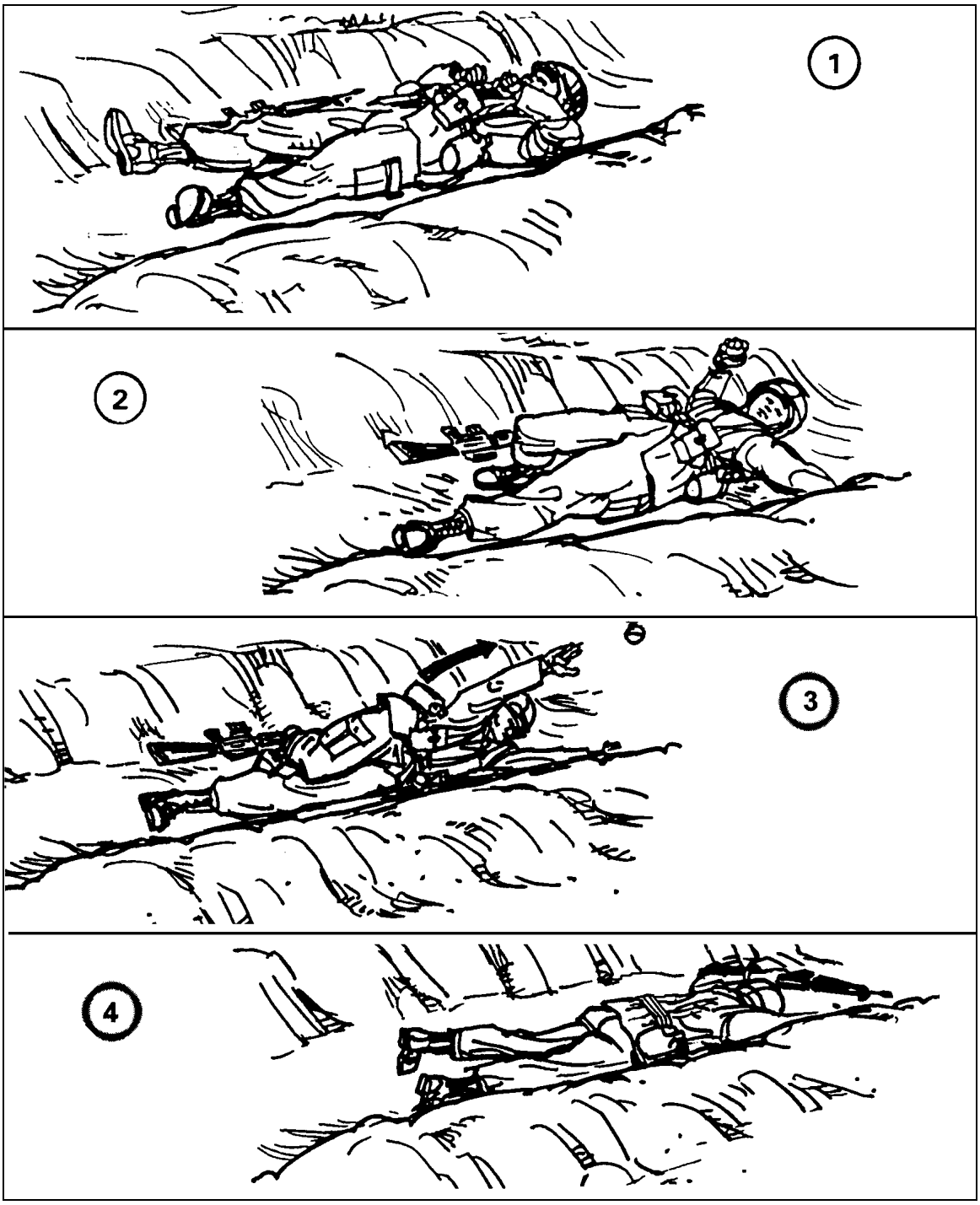


Figure 3-7. Alternate prone throwing position.

Section II. TACTICAL EMPLOYMENT

Hand grenades provide the individual soldier with a number of highly versatile and effective weapons systems. Soldiers employ hand grenades throughout the spectrum of warfare, from low to high intensity conflict, to prevent giving away positions, to save ammunition, and to inflict greater casualties.

3-4. APPLICATION

Soldiers use hand grenades in defensive missions, offensive missions, and retrograde operations. All soldiers use hand grenades during close, deep, and rear operations, during all conditions of combat, and in all types of terrain. Hand grenades have the following specific applications:

- Fragmentation hand grenades are mainly used to kill or wound enemy soldiers but can also be used to destroy or disable equipment.
- Incendiary hand grenades are mainly used to destroy equipment and start fires but can also be used to destroy or disable vehicles and weapons.
- Colored smoke is mainly used to identify or mark positions but can also be used to mark areas for ground-to-ground operations or ground-to-air operations.
- White smoke is mainly used to conceal or create a smoke screen for offensive or retrograde operations.
- Riot-control hand grenades are used to control crowds or riots.
- Stun grenades are used to temporarily stun or disorient the occupants of an enclosed area such as a building or room.

While all hand grenades have application in modern combat, the fragmentation hand grenade remains the most important because it is not only the primary killing hand grenade but also the most dangerous to employ. Fragmentation hand grenades are equally lethal to friendly and enemy soldiers; therefore, we must employ them properly to protect our own soldiers.

3-5. CLOSE COMBAT

On the modern battlefield, the close-in fight can occur anywhere, anytime. The rifle, bayonet, and hand grenade are basic weapons of warfare for the individual soldier. The rifle gives the soldier the ability to kill enemy soldiers with direct fire out to the maximum effective line-of-sight range. Fragmentation hand grenades, on the other hand, allow the soldier to effectively engage and kill enemy soldiers located within a radius of 40 meters where line-of-sight systems, including the rifle, are no longer effective. Since there is no muzzle flash, grenades also help conceal a soldier's position as he engages the enemy. While the rifle is the safest and most discriminating weapon at close ranges, the fragmentation hand grenade is the weapon of choice when the enemy is within range but the terrain masks engagement areas. The fragmentation hand grenade is the soldier's indirect-fire weapon system.

a. Many times in combat, the nature of the targets confronting the infantryman make normal methods of target engagement inadequate. Against soldiers or weapons in trenches or fighting positions, for example, having a grenade burst over the target is more effective. Furthermore, if the targets are on sloping ground, then a grenade needs to detonate as near impact as possible to prevent its rolling away from the target before detonating. Such aboveground detonation also prevents the enemy from securing the grenade and throwing it back within the 4- to 5-second fuze delay.

b. Aboveground detonation is especially critical when engaging bunker-type emplacements. To achieve aboveground detonation or near-impact detonation, remove the grenade's safety pin, release the safety lever, count ONE THOUSAND ONE, ONE THOUSAND TWO, and throw the grenade. This is called *cooking-off*. Cooking-off expends a sufficient period (about 2 seconds) of the grenade's 4- to 5-second delay. This causes the grenade to detonate above ground or shortly after impact with the target. Do not cook-off fragmentation or white phosphorous hand grenades when in training.

CAUTION
Use cook-off procedure only when in a combat environment.

3-6. PLANS AND PREPARATIONS FOR COMBAT

The theater commander normally establishes basic and combat loads of hand grenades. The combat load is not a fixed quantity; it can be altered as the situation dictates. Units vary their combat load depending upon the commander's analysis of METT-T. The most important factor in determining the combat load for hand grenades is unit mission. It influences the type and quantity of hand grenades needed. Other factors used in determining the hand grenade combat load are as follows:

a. **Weight**. Each hand grenade weighs close to one pound. Consequently, each grenade that the soldier carries adds another pound to his total load.

b. **Weapons Tradeoff**. Soldiers cannot carry everything commanders would like to take into battle. Commanders must consider the value of various weapons and munitions with a view toward determining which contribute the most to the mission accomplishment. For example, tradeoff may be required between hand grenades and mines, between hand grenades and mortar ammunition, or between different types of grenades.

c. **Balance**. Different types of hand grenades are required on all missions. Generally, fragmentation and colored smoke grenades are required for all missions. Distribute hand grenades selected for a mission among several soldiers, if not among all of them.

d. **Individual Duties**. Distribute to each soldier the hand grenades that are required for his job and assigned tasks.

3-7. EMPLOYMENT RULES

The rules to remember before employing hand grenades, or when in areas where they are in use, are as follows:

- Know where all friendly forces are located.
- Know your sector of fire.
- Use the buddy or team system.
- Ensure the projected arc of the fragmentation hand grenade is clear of obstacles.
- Evacuate positions into which you plan to throw a fragmentation hand grenade, if possible. If not, then use the grenade sump.

3-8. OFFENSIVE EMPLOYMENT

The fragmentation hand grenade is the primary type of grenade used during offensive operations. These grenades provide the violent, destructive, close-in firepower essential for the individual soldier to overcome and kill the enemy. The fragmentation hand grenade makes the individual soldier's movement easier by suppressing the enemy and disrupting the continuity of the enemy's defensive fires. Fragmentation hand grenades contribute greatly in destroying the enemy's will to continue the fight. The noise, flash, and concussion generated by fragmentation hand grenades have severe psychological effects on enemy soldiers. Offensive grenades are much less lethal than fragmentation grenades on an enemy in the open, but they are very effective against an enemy within a confined space. The concussion they produce is capable of killing or severely injuring enemy personnel, not just stunning them. Consider the following factors when employing hand grenades:

a. The critical phase of the attack is the final assault, that moment when a soldier closes with the enemy to kill him. The individual soldier uses the rifle, the hand grenade, and the bayonet during the assault. The soldier first uses the rifle, firing controlled, well-aimed shots at known or suspected enemy positions. The soldier does this as part of a buddy team, fire team, and squad. He is controlled and disciplined in his movement and application of fires by using the established unit SOPs and battle drills. These battle drills are rehearsed extensively during preparation for combat. As the soldier closes to hand grenade range, he engages the enemy with a combination of rifle fire and hand grenades. He uses fragmentation grenades to kill and suppress enemy soldiers in the open, in defilades, or in trenches. Movement toward the enemy is rapid and violent.

b. Soldiers must throw hand grenades accurately into enemy positions to reduce the chances of friendly hand grenades hitting friendly forces. Movement forward is done as part of a buddy team. One soldier within the buddy team provides overwatching, direct suppressive fire while the other soldier moves forward. Both soldiers must take advantage of the grenade explosion to immediately continue their movement forward. If the enemy is located in an enclosed area, such as a bunker or room within a building, the offensive grenade may be more appropriate than the fragmentation hand grenade. Choosing between them depends upon availability and mission analysis beforehand. Offensive grenades are less lethal to the enemy, but because of this, they are also safer to employ in confined spaces. Soldiers should follow offensive grenade employment immediately with violent rifle fire unless capturing enemy personnel is a mission requirement. Remember, an enemy who is only temporarily stunned can still kill you. The shock waves from an offensive grenade also provide better overall interior effect in an enclosed space. Another advantage of the offensive grenade is that it covers more of an enclosed space than the fragmentation grenade.

c. In an assault against a dug-in, well-prepared enemy, the soldier uses hand grenades to clear crew-served weapons first. Once the first defensive belt has been penetrated, he uses hand grenades in a priority effort to attack command bunkers and communications equipment and to kill or capture enemy leaders within those bunkers.

d. In the assault, the soldier participates as a squad member in clearing trenches, destroying bunkers, and clearing rooms. The soldier employs unit procedures, which have been rehearsed during preparation for combat. In clearing a trench within a fortified position (Figure 3-8), the buddy team forms the basis for all fragmentation grenade employment in the following manner:

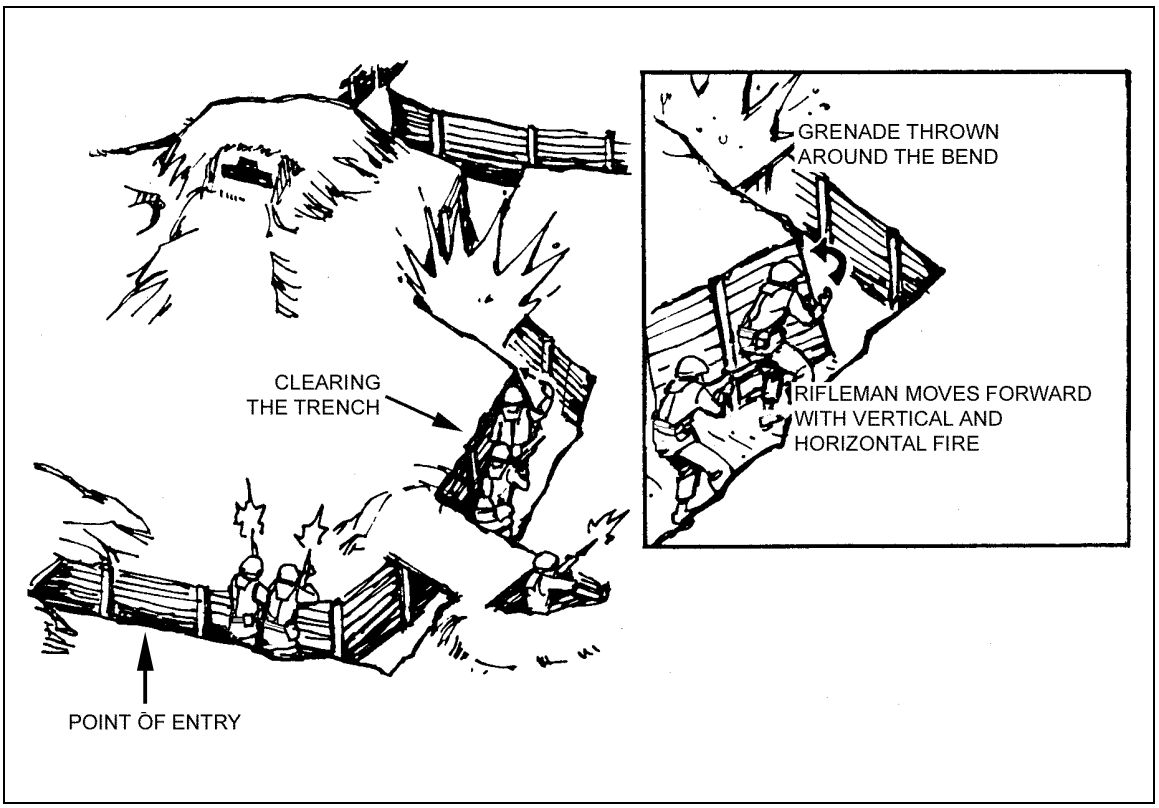


Figure 3-8. Enemy trench assault.

(1) Before entering the trench, the first clearing team throws or drops hand grenades into the trench, attempting to keep the individual grenades separated by at least five meters.

(2) After the grenades explode, the first clearing team rolls into the trench, landing on their feet and firing their weapons down both directions of the trench.

(3) The first clearing team holds the entry point.

(4) The teams following the first clearing team enter at the same position and begin clearing in one direction only (FM 7-8).

(5) As the lead buddy team moves to the right (or left), one soldier is the designated grenadier. He moves along the wall closest to the next bend in the trench. His movement is covered by his buddy, who is ready to fire at any enemy soldiers advancing toward them. The grenadier holds a grenade at the ready as he moves rapidly down the trench.

(6) At the bend in the trench, the designated grenadier throws a grenade around the bend. After the explosion, the rifleman moves rapidly around the bend and fires rapid bursts horizontally and alternately along the long axis of the trench.

(7) Movement down the trench continues by alternating the designated rifleman and grenadier roles or maintaining the same roles throughout. Fire teams and squads are bounded forward to continue clearing the trench line.

NOTE: The unit SOP specifies many of these tasks. If a three-man clearing team is used, the third member guards the back of the other team members and stands by to provide fire on point targets. (For action on the objective, see FM 7-8.)

e. Clearing an enemy bunker and killing the enemy soldiers inside requires violence and speed of execution, plus synchronization of effort at the buddy and squad level, in order to succeed. The following are procedures for clearing a bunker (Figure 3-9):

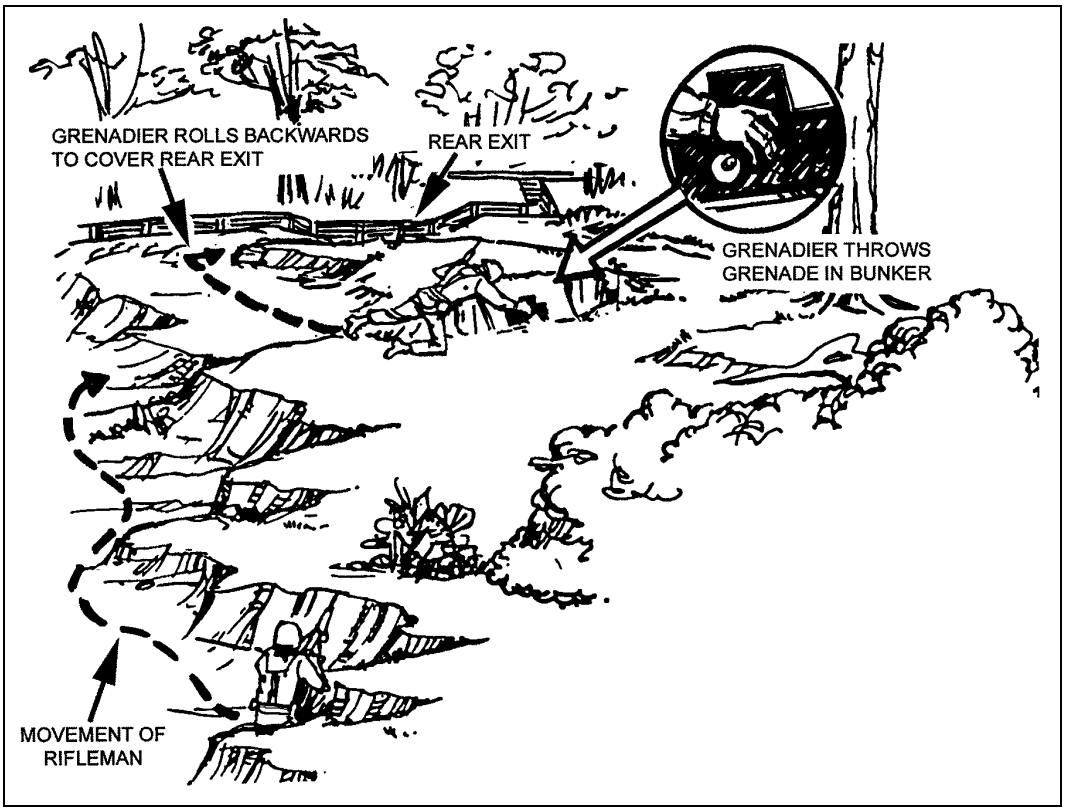


Figure 3-9. Enemy bunker assault.

(1) A two-man team assaults a single bunker using a combination of grenades and rifle fire. One member of the buddy team provides overwatching suppressive fire while the other member moves rapidly toward the bunker, using a combination of individual movement techniques. He uses the best available covered route to move toward the bunker.

(2) As he approaches to within 75 meters of the bunker, the grenadier can use white smoke to help conceal his movement for the remaining distance. The white smoke grenade should be thrown on line with the bunker and as close to the enemy's firing port as possible.

(3) Once the grenadier member of the buddy team is at the side of the bunker, he holds the grenade at a 90-degree angle from his body, releases the safety lever, mentally counts two seconds (ONE THOUSAND ONE, ONE THOUSAND TWO), and throws or pushes the grenade into the firing port of the bunker. Once he releases the grenade, he rolls away from the bunker and faces to the rear of the bunker, prepared to engage escaping enemy soldiers with his rifle.

(4) After the grenade detonates, he enters the position from the rear to kill or capture remaining enemy soldiers.

f. When clearing a room or moving through an urban area, the following considerations apply:

- What types of grenades do the ROE permit and restrict?
- What effect do I want to achieve--kill, stun, obscure, destroy equipment, mark a location, and so forth?
- Does the structural integrity of the room and building permit the types of grenades selected for use?
- Will the scheme of maneuver permit the use of fragmentation grenades and not cause fratricide?
- Will the type of grenade used cause an urban fire in an undesired location?

If employing grenades during room clearing, the following procedure should be used in conjunction with Battle Drill 6, FM 7-8, or Battle Drill 5, FM 7-7J:

(1) The Number 2 man throws a grenade into the room and yells FRAG OUT, STUN OUT, or CONCUSSION OUT, if stealth is not a factor, to alert friendly personnel that a grenade has been thrown toward the threat. After the grenade explodes, the Number 1 man enters the room, eliminates any threat, and moves to his point of domination IAW Battle Drill 6.

(2) Numbers 3 and 4 men enter the room, move to their points of domination, and eliminate any threat.

(3) The team clears and marks the room IAW unit SOP.

NOTE: Grenades tend to roll back down stairs and either nullify the desired effect(s) or cause friendly casualties.

g. The use of hand grenades during raids always depends on the mission. The raid, as a type of offensive operation, is characterized by heavy use of fragmentation and offensive grenades, but it may also require other types of grenades. Use grenades according to the following guidelines:

(1) If the mission is to secure prisoners, the employment of offensive grenades is appropriate.

(2) If the mission calls for the destruction of vehicles, weapons, or special equipment, then incendiary grenades and fragmentation grenades are appropriate.

(3) Smoke grenades are often used to create a smoke screen covering the advance of friendly forces or to mark the location of friendly forces and pickup points. Colored smoke is used mainly for signaling purposes.

h. Reaction to an enemy ambush requires an immediate, rapid, and violent response. The longer friendly forces remain in the ambush kill zone, the greater the probability of friendly force destruction. FM 7-8 and ARTEP 7-8 Drill describe friendly force reactions. Using a combination of fragmentation hand grenades to kill the enemy and white smoke grenades to obscure the enemy’s sight and rifle fire, the soldiers within a squad assault the enemy force. Train and drill soldiers to throw fragmentation grenades first, then smoke grenades.

3-9. DEFENSIVE EMPLOYMENT

Hand grenades are used in defensive operations during the final phase of the close-in battle. The primary hand grenade in all defensive operations is the fragmentation grenade. It is used in conjunction with other weapons and man-made or natural obstacles to destroy remnants

of the attacking enemy force that have succeeded in penetrating the more distant barriers and final protective fires. The fragmentation hand grenade further disrupts the continuity of the enemy attack, demoralizes the enemy soldier, and forces the enemy into areas covered by direct-fire weapons, such as rifle and machine gun fire and Claymore mines. Using fragmentation hand grenades on dismounted enemy forces at a critical moment in the assault can be the final blow in taking the initiative away from the enemy.

a. **Defense From Individual Fighting Positions** (Figure 3-10). From individual fighting positions, fragmentation hand grenades are used primarily to cover close-in dead space approaches on the friendly side of the protective wire and in front of a squad's position. Soldiers should use these grenades in conjunction with ground flares positioned along the protective wire. Enemy soldiers who are stopped at the protective wire are engaged first with Claymore mines. If time permits during the preparation of the defensive position, soldiers should identify dead space in their sectors, especially dead space that may intersect the protective wire and move toward the friendly fighting positions. These potential avenues of approach through the protective wire should be marked with a reference to identify them as primary hand grenade targets. The following rules apply when employing fragmentation hand grenades from fighting positions:

(1) Clear overhead obstructions that may interfere with the path of the thrown grenade. Do this at the same time direct-fire fields of fire are cleared.

(2) Rehearse grenade employment; know where your primary target is located.

(3) Keep 50 percent of your fragmentation grenades at the ready in your fighting position, leaving the remaining fragmentation grenades on your load-carrying equipment (LCE).

(4) Rehearse actions needed if an enemy grenade lands in your fighting position.

(5) Employ fragmentation hand grenades against enemy soldiers located in defilade positions as first priority. This lessens the danger to friendly soldiers and helps cover terrain not covered by direct-fire weapons. Use the rifle to kill enemy soldiers not in defilade positions.

(6) Reconnoiter the alternate and supplementary positions and determine the priority for the fragmentation hand grenade target.

(7) Redistribute hand grenades after each enemy engagement.

WARNING

Former Soviet Union grenades use fuzes with only a 3- to 4-second delay, which means you have very little time to react. The preferred course of action if an enemy grenade lands in your position or near you is to immediately roll out of your fighting position or throw yourself flat on the ground.

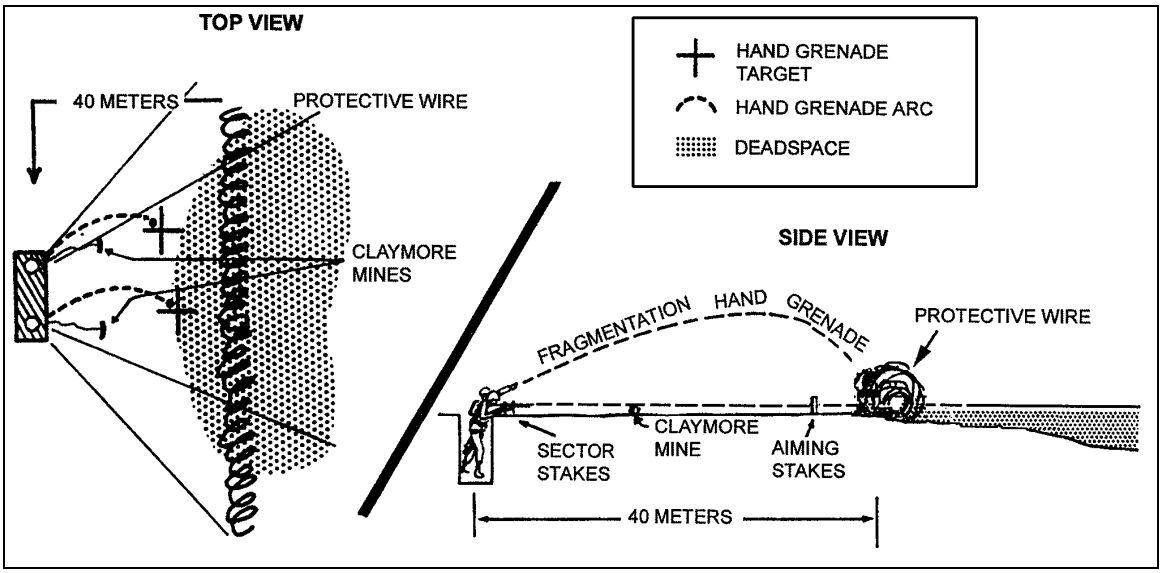


Figure 3-10. Defense from an individual fighting position.

b. **Defense Against Enemy Armored and Tracked Vehicles** (Figure 3-11). On occasion, friendly dismounted soldiers may come in close contact with enemy armored formations. Dismounted infantry should first use antitank weapons to defeat enemy armor and motorized infantry. Soldiers can also use satchel charges, as described in FM 5-250, to defeat enemy armor. If these are not available, it is still possible to destroy, immobilize, or render inoperative the vehicle or system, or to kill the crew inside the vehicle. In either case, the soldier must approach the armored vehicle to kill it or the crew with hand grenades. An understanding of some characteristics and vulnerabilities of former Soviet Union armor can help kill or disable the enemy armored vehicle or its crew. Vulnerabilities common to most threat vehicles are the fuel cells, ammunition storage areas, and power trains. Figure 3-12 highlights vulnerable areas on selected threat vehicles.

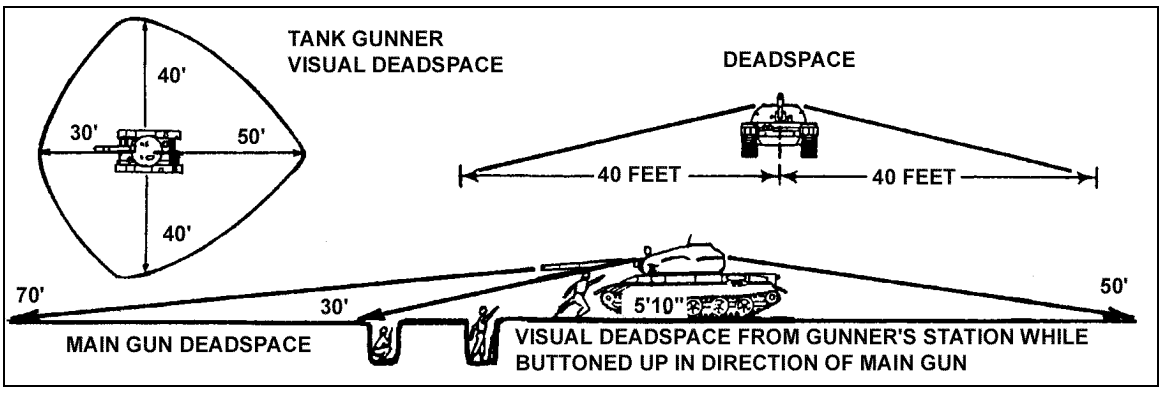


Figure 3-11. Attack of a former Soviet Union tank.

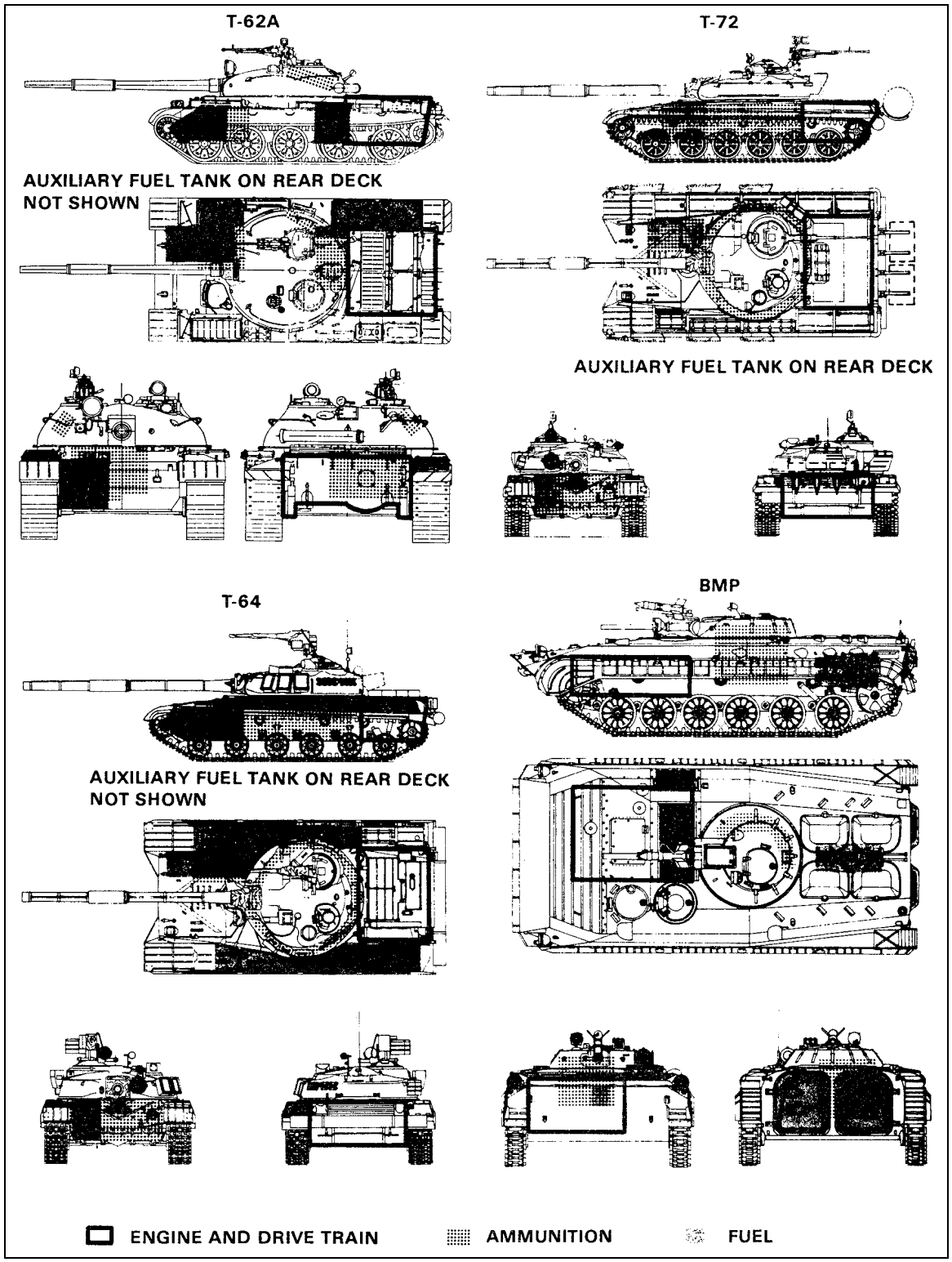


Figure 3-12. Former Soviet Union vehicle vulnerabilities.

(1) *Turret rotation*. The turrets of older former Soviet Union tanks rotate much slower than those on US and NATO tanks. It takes more than 21 seconds for T60- and T70-series tanks to rotate through a full 360 degrees. The T80- and T90-series (Figure 3-13) tanks rotate a full 360 degrees in just 6 seconds, which is as fast as the US's M1 Abrams and M2 BFV. With the older former Soviet Union tanks, a soldier can actually run around the tank before the turret traverses from the front deck to the rear. The newer tanks have been fitted with explosive reactive armor, which makes them more difficult to engage with antitank weapons. Therefore, engagement with hand grenades should be considered only as a last resort.

(2) *Visual dead space*. From the gunner's station of a former Soviet Union tank, nothing at ground level within 30 feet can be seen through the frontal 180 degrees of turret rotation. If the turret is oriented over the rear 180 degrees (the rear deck), the dead space increases to 50 feet. This means gunners on former Soviet Union tanks cannot see soldiers in fighting positions within these distances of the tank.

(3) *Fire extinguisher system*. A fire extinguisher system can be triggered manually or automatically by one of eight heat sensors. The fire extinguisher's ethylene bromide gas creates a poisonous vapor when exposed to flames. If the extinguisher discharges, the crew may have to bail out. Any weapon that can trigger a fire and the fire extinguisher system might possibly knock out a former Soviet Union tank.

(4) *BMP visual dead space*. The BMP has nine vision blocks for the eight infantrymen in the rear of the vehicle. Eight of these vision blocks, four on each side, correspond to the firing ports for the squad's weapons. These vision blocks are oriented at a 45-degree angle toward the vehicle's direction of movement. The soldier at the left rear of the vehicle mans either the left rear vision block or the last vision block and firing port on the left side. If the flank firing port is being manned, the vehicle is vulnerable to an approach from the rear. Dismounted soldiers should attempt to destroy or disable enemy armor only as a last resort. When employing hand grenades for this purpose, follow these procedures:

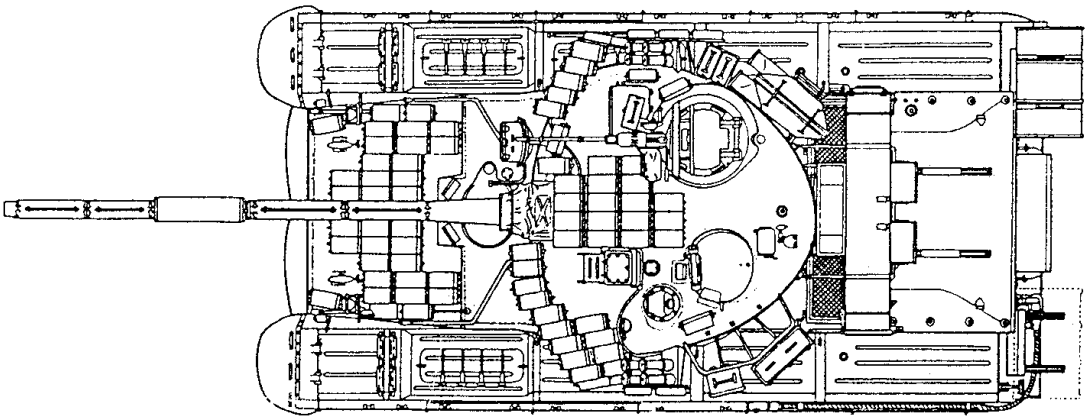
- Remain in a covered fighting position until the vehicle closes to within its visual dead space. Approach the vehicle from the rear, moving aggressively.
- Place an incendiary grenade over the engine compartment.
- Attempt to drop a fragmentation grenade into an open hatch if incendiary grenades are not available.
- Engage any crewmen who exit the vehicle.

c. **Defensive Employment on Urban Terrain**. The considerations for the defensive employment of grenades on urban terrain are generally the same as offensive considerations with respect to ROE, structural integrity of the building, fratricide avoidance, and desired effects of the type grenade to be used. Additionally, the following also apply:

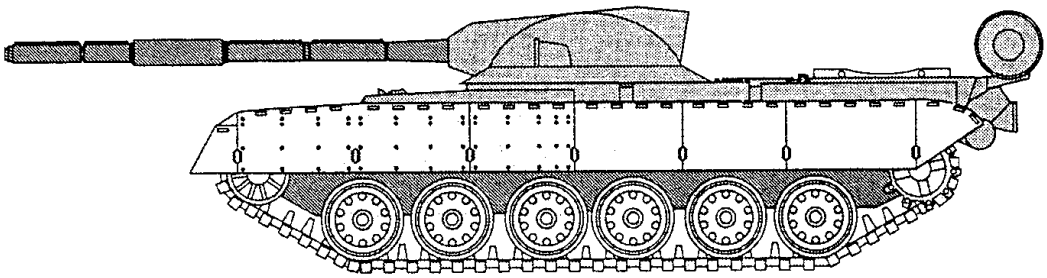
(1) Fragmentation grenades can be very effective in producing casualties when thrown at assaulting enemy troops between buildings or on streets from windows, doors, mouseholes, or other building apertures.

(2) Stun grenades can cause confusion and hesitation when thrown at assaulting enemy soldiers, allowing time for withdrawal from rooms. This is especially useful if the structural integrity of the building does not permit the use of fragmentation or concussion grenades.

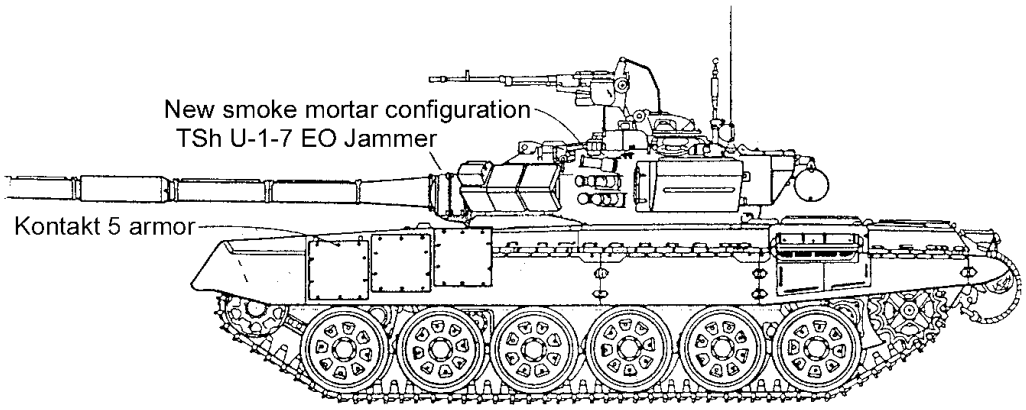
(3) Use of smoke grenades inside buildings may displace oxygen in poorly ventilated rooms and make breathing difficult while also rendering protective masks ineffective.



The T-80 BV is the T-80 B with explosive reactive armor fitted to its hull and turret; the forward parts of the skirts are also reinforced on this model (Steven Zaloga).



Outline drawing of a T-80 MBT chassis fitted with a low-profile turret armed with a 135 mm/140 mm gun fed by an automatic loader with crew seated in hull front (Jane's Intelligence Review)



Russian T-90 MBT showing key features (Steven Zaloga)

Figure 3-13. T80- and T90-series former Soviet Union tanks.

3-10. RETROGRADE OPERATIONS EMPLOYMENT

Most of the employment considerations applicable to the use of hand grenades in the defense are equally applicable to retrograde operations. Special applications or considerations for hand grenade use during retrograde operations relate to creating obstacles, marking friendly force locations, and breaking contact.

a. **Create Obstacles**. When terrain conditions permit, soldiers can use incendiary grenades to impede and disrupt enemy movement by initiating fires in specific areas.

b. **Mark Locations**. Soldiers can use colored smoke hand grenades to mark friendly force positions and identify friendly forces.

c. **Break Contact**. During retrograde operations, some elements of the friendly force most often become decisively engaged. Soldiers can use fragmentation, white smoke, and CS grenades to break contact and regain flexibility of maneuver. Use of hand grenades in volley fire following the employment of white smoke is especially effective. The smoke obscures enemy observation of friendly force movement from covered positions, and the fragmentation grenades force the enemy to cover.

3-11. REAR AREA OPERATIONS EMPLOYMENT

Army operations doctrine recognizes that the nature of a future war poses a significant threat to rear areas. These threats range from large operational maneuver groups to highly trained, special operating forces and even terrorists. All US soldiers in combat, CS, and CSS units must be prepared to fight using small arms, antitank weapons, Claymore mines, and fragmentation grenades. At every element level throughout the corps battle area, individual US soldiers must react to every action by aggressive, violent employment of grenades and individual weapons. There is no safe zone on the battlefield; therefore, leaders must plan for the following:

a. **Special Considerations**. Two features of rear area operations provide for unique considerations concerning hand grenade employment. In certain areas of the world, the US Army and its allies must anticipate a large number of civilian refugees moving into and through the rear area. This situation can be confusing with the large numbers of CS and CSS units operating throughout the rear area. These factors dictate the following guidelines for hand grenade employment in the rear areas:

(1) *Offensive grenades*. Individual soldiers throw offensive grenades at enemy soldiers in situations where noncombatants and support troops may be intermingled with threat forces.

(2) *Riot-control grenades*. It is reasonable to expect enemy special forces, special agent provocateurs, and fifth columnists to attempt to incite riots in our rear areas, especially if the conflict begins to stalemate and does not result in the rapid victory for either side. Forces in the rear area must quell these riots as rapidly as possible while reducing damage to the lives and property of noncombatants. Riot-control grenades, which are usually associated with peacetime law and order functions, also have relevancy in maintaining control of the rear area.

b. **Base Cluster Defense**. Base cluster commanders must organize the defense of their positions in much the same manner as tactical commanders in the MBA. Accordingly, the employment of hand grenades from defense positions surrounding the base cluster should follow the same considerations as hand grenade employment by combat units in the MBA.

3-12. USE UNDER ADVERSE CONDITIONS

While hand grenade procedures do not change when employed under adverse conditions, special cautions must be considered.

a. **MOPP4**. Exercise additional caution when employing hand grenades in MOPP gear. The thrower should execute arming and throwing procedures carefully and deliberately and should concentrate on using the proper grip. Observing each arming action (removal of safety clip and safety pin) is also recommended in MOPP. Note that wearing gloves inhibits the thrower's feel and could decrease his throwing ability and range.

b. **Night**. Throwers must have clear fields of fire with no overhead obstructions. Depth perception is generally impaired under limited visibility conditions.